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DRYOPTERIS MARGINALIS (DRYOPTERIDACEAE): NEW TO TEXAS

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ABSTRACT

Dryopteris marginalis (L.) A. Gray, the marginal wood fern, is reported as new to the native flora of Texas. The species is known only from Hemphill County, which is located in the southern Great Plains of the Panhandle area of the state. A voucher map of distribution of the fern in Texas and Oklahoma is included, along with a discussion of associated vegetation and notes on historical occurrence.

KEY WORDS: *Dryopteris*, Dryopteridaceae, Texas Panhandle, Canadian River, Hemphill County, Rolling Plains, Great Plains.

Until now, four species of *Dryopteris* (wood ferns) have been known to occur in Texas: *D. celsa* (W. Palmer) Knowlton (Diggs et. al. 2006), *D. cinnamomea* (Cav.) C. Christensen, *D. filix-mas* (L.) Schott, and *D. ludoviciana* (Kunze) Small (Turner et al. 2003). Recent botanical field investigations in the Panhandle region of Texas have resulted in the discovery of a fifth species, *Dryopteris marginalis* (L.) A. Gray, which we document here as new for the state.

Voucher: **TEXAS**. **Hemphill Co.**: Gene Howe Wildlife Management Area; along terraced stream bank adjacent to the Canadian river, 15 Oct 2009, *J.R. Singhurst 17614* (BAYLU). Figs. 2 and 3.

Dryopteris marginalis is the only known member of the genus in North America with sub-marginal/marginal sori (see Fig. 3). It can be readily distinguished from the other species of *Dryopteris* by the sori location and by the tawny scales on stipe and rachis. *Dryopteris filix-mas* and *D. celsa* may superficially resemble *D. marginalis* but both have serrate pinnae margins, whereas *D. marginalis* has entire pinnae or slightly lobed margins, not toothed. In *D. ludoviciana*, segments of fertile pinnae are distinctly narrower than sterile pinnae and occupy only the distal third to half of the blade. Lastly, *D. cinnamomea* has small laminae (14–26 cm length), stramineous to greenish (rarely castaneous) stipes with abundant long scales (8-18 mm) possessing entire margins, acuminate, twisted tips, and glandular adaxial and abaxial laminar surfaces. In Texas, *D. cinnamomea* is known only by a collection from ValVerde County near Comstock. The preceding paragraph of discriminating

characters is adapted from Lellinger (1985), Mickel & Beitel (1988), McVaugh (1992), and Montgomery and Wagner (1993).

Located on the eastern edge of the Texas Panhandle, the vegetation of Hemphill County is part of the mixed grass prairie of the Great Plains. In Texas, this area is known as the Rolling Plains vegetational region reflecting a natural plant community contingent on grassland development and diversification since at least the Miocene (Weaver 1954; Barnard & Frankel 1964). Nonetheless, the county includes many species that occur in similar riparian environments throughout the eastern United States. Characteristic eastern herbaceous species reported from Hemphill County are *Eupatorium perfoliatum*, *Euthamia gymnospermoides*, *Hibiscus laevis*, *Pluchea camphorata*, and *Thalictrum dasycarpum*. Notable eastern woody plants are *Cornus drummondii*, *Diospyros virginiana*, and *Morus rubra*, all infrequently occurring in the bottomlands of the Canadian River. Interesting or unusual species of the area are *Berula erecta* and *Verbena hastata*. The most abundant woody plants in Gene Howe Wildlife Management Area (GHWMA) bottomlands are *Ulmus americana*, *Celtis occidentalis*, and *Populus deltoides*, while *Quercus stellata*, *Sapindus saponaria* var. *drummondii*, and *Ulmus pumila* are principally limited to sloped and upland areas.

The western distributional limit of *Dryopteris marginalis* in the southern USA extends to central Oklahoma (McGregor & Barkley 1977, 1986; Montgomery & Wagner 1993). The known occurrence nearest to the Hemphill County record is in Comanche County, Oklahoma (Fig. 1), which is approximately 200 km to the southeast. The Canadian River, flowing west to east, bisects Hemphill County and portions of GHWMA. This river corridor is an important consideration, in concert with various influences of engineered or natural succession that contribute to landscape alterations. We postulate that these dynamics may have contributed to the distributional expansion of eastern herbaceous species such as *Dryopteris marginalis*.

Whether the occurrence of *Dryopteris marginalis* in Hemphill County resulted from eastern woodland encroachment or resulted from Pleistocene glaciations is unknown. It is plausible that environmental alterations, possibly by humans, contributed to the westward spread of the species. Over the last two centuries, anthropogenic influences have promoted westward expansion of more eastern riparian woodlands (Tomelleri 2004), especially throughout river corridors and associated mesic areas of the Great Plains (Johnson 1994). Extirpation of historic herbivore communities and subsequent replacement by domestic cattle pursuits are conspicuous examples of this influence. Repeated prairie fire suppression coupled with increased agricultural cultivation and continued introduction of alien species have also profoundly affected the natural regime and distributions of native plant species in the Great Plains.

The core of diversity for *Dryopteris* (Dryopteridaceae), a genus of about 250 species, is centered in temperate Asia (Wagner 1970; Montgomery & Wagner 1993; Smith 1993). Contemporary distributions of 14 known *Dryopteris* species in the USA and Canada (Montgomery & Wagner 1993) suggest a Pan-Tertiary migration, perhaps in combination with Pleistocene inter-glaciations. Peck and Peck (1988) discussed these taxa affinities, e.g. polyploidy and production of hybrids, and Pleistocene glaciation events that may have created conditions fostering diversification and current phytogeographic patterns of *Dryopteris* in North America.

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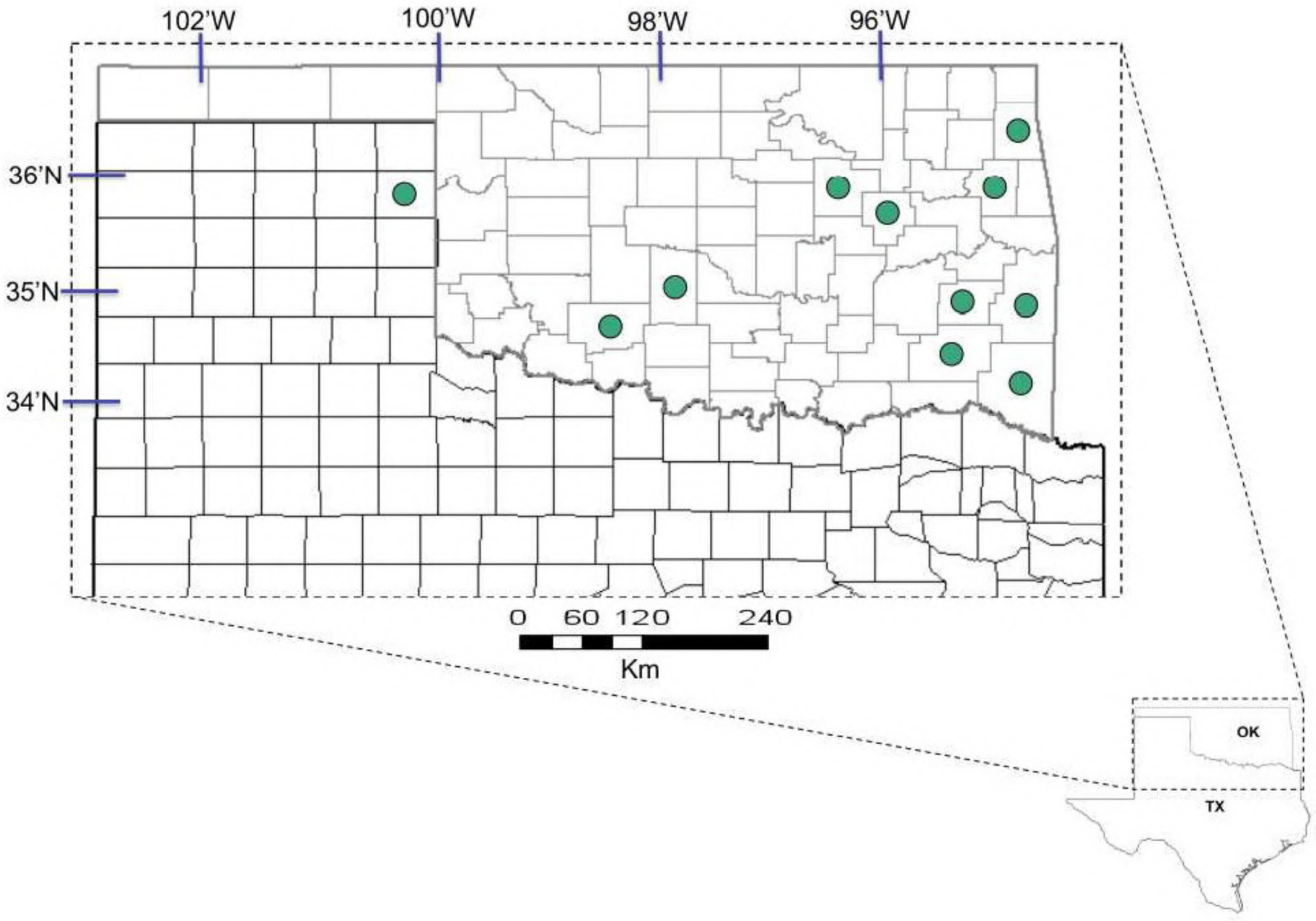

Figure 1. Known county distribution of *Dryopteris marginalis* in Oklahoma and Texas (from McGregor & Barkley 1977, 1986; Oklahoma Biological Survey 2010).

Figure 2. *Dryopteris marginalis*. Voucher, Hemphill Co., Texas (*Singhurst 17614*).

Figure 3a and b. *Dryopteris marginalis*. Voucher with mature submarginal sori, Hemphill Co., Texas (*Singhurst 17614*). The image below is from the upper one.